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DEPARTMENT OF
ENVIRONMENTAL MANAGEMENT
SOLID & HAZARDOUS WASTE MANAGEMENT

SAFETY PLAN FOR PCB
AND ASBESTOS DECONTAMINATION
PROJECT AT THE BRC INJECTED
RUBBER PRODUCTS FACILITY IN
CHURUBUSCO, INDIANA

Submitted to:

Dana Corporation
Toledo, Ohio

O.H. Materials Corp.



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Project File No. 3691

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1.0 PROJECT DESCRIPTION

At the BRC Injected Rubber Products gasket and rubber molding factory in Churubusco, Indiana, O.H. Materials Corp. (OHM) is conducting a PCB and asbestos decontamination project. Factory operations included heating the molding machines which formed the gasket and rubber products; during this process, PCB-containing heat transfer fluids were circulated from a central boiler to the individual machines through asbestos-covered piping running through two trenches in the floor. Over a period of several years, some of this fluid escaped from the pipes and contaminated the trench, from which the material collected in a sump and was pumped into the sewer.

To remove the PCB material from the trench, the asbestos-covered piping must be removed, requiring asbestos-control procedures to be implemented.

Following decontamination of the trenches, the sewer sections will be plugged and flushed of PCB-containing sediment. This sediment will be removed by a vacuum truck, and the sewer will be unplugged and returned to normal operation.

2.0 SPECIFIC HAZARDS

Two chemicals, asbestos and PCB, are of concern at this site. Personal protective equipment and work procedures have been carefully selected to ensure adequate employee protection.

In general, the acute (fast-acting) effects of these materials of which workers should be aware are as follows:

- o Acute exposure to asbestos fibers would first result in eye, nose, and throat irritation. The more insidious asbestos-related diseases such as mesothelium will not manifest themselves for 10 to 25 years.
- o Acute effects denoting PCB exposure generally include a sharp, sweet, chlorine-type odor from the oil. Eye, nose, and throat irritation may occur. Since this is aged oil, these signs may not occur. Thirty to ninety days following dermal contact, either an acne-type lesion (chloracne) or skin darkening (hyperpigmentation) may develop.

All workers should be aware of any strange odors, irritation, and feelings of discomfort or extreme well being. Often these signs can indicate chemical exposure is occurring.

Further chemical information on these materials is presented in Appendix A.

3.0 WORK AND SUPPORT AREAS

To prevent potential migration of contamination caused by tracking by personnel or equipment, work areas and personal protective equipment are clearly specified prior to beginning operations. OHM has designated work areas or zones as suggested by the NIOSH/OSHA/USCG/EPA's document titled "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities." Each work area will be divided into three "zones:" an exclusion or "hot" zone, a contamination reduction zone, and a support zone.

3.1 EXCLUSION ZONE

The exclusion zone will consist of areas where inhalation, oral contact, or dermal contact with contaminants is possible.

For this project, a visqueen protective barrier will be built over the two work trenches to control any possible release of contaminants. In addition, brightly colored hazard tape will be placed 3 to 4 feet from the perimeter of the visqueen cover. All personnel entering the inside of the visqueen barrier must wear the prescribed level of protective equipment.

3.2 CONTAMINATION REDUCTION ZONE

The contamination reduction zone is a corridor between the exclusion zone and support zone. In this area, personnel will begin the sequential decontamination process when exiting the exclusion zone. To prevent cross contamination and for accountability, all personnel will enter and leave the exclusion zone through the contamination reduction zone.

The contamination reduction zone will be another visqueen structure attached to the trench covering visqueen barrier. This area will be divided by visqueen drapes into two separate areas. One area will be where the Tyvek suits are vacuumed and removed, and a second area will be where respirators can be taken off.

3.3 SUPPORT ZONE

The support zone will consist of areas outside the exclusion and contamination reduction zone. Eating, smoking, and drinking will be allowed only in the support zone.

4.0 PERSONAL PROTECTIVE EQUIPMENT

To protect workers from exposure to the asbestos and PCB present, the following personal protective equipment will be worn.

4.1 LEVEL D PROTECTION

General site work will require Level D protective equipment, defined as:

- o Steel-toed work boots
- o Hardhat
- o Eye protection
- o Cotton or nitrile gloves
- o Work clothes
- o Hearing protection (if necessary)

4.2 LEVEL C PROTECTION

When personnel are removing asbestos insulation, cleaning trenches of sludge, and performing high-pressure washing, Level C protection will be required in the exclusion zone, and the following equipment shall be used:

- o Job-issue cotton coveralls
- o Saran-coated Tyvek protective suit with hood (when casual contact with liquids is anticipated)
- o PVC rain suit (required for work with liquids such as dewatering or high-pressure washing operations)
- o Steel-toed shoes/boots
- o Vinyl booties (for equipment operators or in addition to robar boots for other personnel)
- o Robar boots
- o Vinyl sample gloves
- o Nitrile or Viton gloves
- o Hardhat with face shield
- o Hearing protection (if necessary)

- o Foot and shin guards (for high-pressure washing operations)
- o Full-face respirator with appropriate cartridges (see Section 6.0)

All joints between protective garments will be sealed with vinyl duct tape.

4.3 LEVEL B PROTECTION

For work involving sewer manhole entry if an oxygen deficiency has been found, Level B protection will consist of:

- o Job-issue cotton coveralls
- o Saran-coated Tyvek protective suit with hood (when casual contact with liquids is anticipated, such as entering manholes to plug the sewer)
- o PVC rain suit (required for work with liquids and dewatering operations)
- o Steel-toed shoes/boots
- o Vinyl booties (in addition to robar boots)
- o Robar boots
- o Vinyl sample gloves
- o Nitrile gloves
- o Hardhat with face shield
- o Hearing protection (if necessary)
- o Supplied-air respirator (airline or self-contained breathing apparatus [SCBA])

5.0 DECONTAMINATION PROCEDURES

In order to prevent the migration of asbestos fibers and PCB from the work area to support areas, careful decontamination of personnel and equipment must take place.

5.1 PERSONNEL DECONTAMINATION

Personnel will decontaminate in the following fashion:

1. Just prior to exiting the work area, personnel will damp wipe any adhered particulate material from either their exterior or their buddies' exterior. Careful attention will be paid to boots and gloves.
2. Personnel will step through the visqueen drapes into the first area. For asbestos, they will vacuum respirators, Tyvek suits, boots, and gloves. Tyvek suits, boots, and gloves will be removed here during both PCB and asbestos operations.
3. Personnel will step into the second area where respirators will be removed and cartridges discarded.
4. Personnel will proceed to the decontamination trailer where job-issued coveralls will be removed and placed directly in the washer. This area will have a visqueen barrier erected, separating it from the rest of the trailer.
5. Personnel will enter the shower. Following a complete shower, personnel will exit through another visqueen barrier, don street clothes or clean coveralls, and proceed with normal activities.

5.2 EQUIPMENT DECONTAMINATION

Any equipment taken into the asbestos exclusion zone must be damp wiped and vacuumed or washed before removing from the area. Any equipment which cannot be cleaned will be disposed as asbestos-containing waste.

Following project completion, all gloves and boots will be discarded as contaminated waste.

5.3 SUSPECTED CONTAMINATION

Any employee suspected of sustaining skin contact with chemical materials will use the emergency shower in the decontamination trailer. Here the worker will remove clothing, shower, and don clean clothes.

5.4 PERSONAL HYGIENE

Before any eating, smoking, or drinking, personnel will wash hands, arms, neck, and face.

5.4.1 Other Decontamination Procedures

All liquids and disposable clothing will be treated as contaminated waste and disposed properly by drumming (if solid) or held in the water containment system. Personnel handling contaminated waste will wear Level D protection if the waste is enclosed by drums or bagged. For bagging and drumming operations, workers will wear Level C protection.

6.0 RESPIRATORY PROTECTION

Activities associated with cleaning this facility will require personnel to wear air-purifying respirators. If an oxygen deficiency is found in the sewer, supplied-air respirators will be necessary.

6.1 AIR-PURIFYING RESPIRATORS

Air-purifying respirators for this project will be the American Optical Full-face "Commander" type.

6.1.1 Cartridges

For insulation removal, PCB sludge cleaning, and high-pressure washing, R53-HE cartridges will be used. This cartridge provides protection against organic vapors, chlorine, hydrogen chloride, sulfur dioxide, dusts, fumes, mists, radon daughters, asbestos-containing dusts and mists, radionuclides, and pesticides.

6.1.2 Cartridge Changes

All cartridges will be changed at each exit during asbestos removal and PCB cleaning; however, water saturation of the HEPA filter or dusty conditions may necessitate more frequent changes. Changes will occur when personnel begin to experience increased inhalation resistance.

6.2 SUPPLIED-AIR RESPIRATORS

Personnel entering a sewer which has been found to be oxygen deficient will wear either Survivair 9881-02 hippack airline respirators with 5-minute air egress bottles or Survivair Mark 2 positive-pressure SCBA units.

6.3 INSPECTION AND CLEANING

Respirators are checked periodically by a qualified individual and before each use by the wearer. All respirators and associated equipment will be decontaminated and hygienically cleaned after use.

6.4 BREATHING AIR QUALITY

Code of Federal Regulations 29 1910.134 states breathing air shall meet the requirement of the specification for Grade D breathing air as described in the Compressed Gas Association Specification G 7.-1966. OHM requires a certificate of analysis from vendors who supply the breathing air to show the air meets this standard before operations start and any time their process changes.

The preferred method for creating breathing air shall be to mix liquid oxygen and liquid nitrogen. Air compressors located at project sites are not acceptable because of possible contamination at the intake of the pump and excessive analytical costs of sampling the air.

6.5 FIT TESTING

Respirator fit tests will be administered to all personnel weekly. The challenge will be either isoamyl acetate or irritant smoke. A record of this test will be kept.

6.6 FACIAL HAIR

No personnel who have facial hair which interferes with the respirator's sealing surface will be permitted to wear a respirator.

6.7 CORRECTIVE LENSES

Normal eyeglasses cannot be worn under full-face respirators because the temple bars interfere with the respirator's sealing surfaces. For workers requiring corrective lenses, special spectacles designed for use with respirators will be provided.

6.8 MEDICAL CERTIFICATION

Only workers who have been certified by a physician as being physically capable of respirator usage will be issued a respirator.

7.0 AIR MONITORING

Air monitoring will be performed to check atmospheres of confined spaces and to ensure personnel decontamination procedures are adequate.

7.1 ASBESTOS REMOVAL OPERATION

A minimum of three sets of air samples will be collected in the asbestos removal area. The first set will be collected prior to any removal operations to establish a baseline with which to compare latter sampling data. The second round of sampling will occur during the removal operations inside the work area, in the contamination reduction zone, and outside the visqueen trench barrier. This data will serve two purposes: to verify that removal techniques are effective in controlling fiber release and to ensure fibers are not being carried into "clean" areas. Based upon data results and project length, this sampling round may be repeated. The final round of sampling will ensure that the asbestos has been removed and the area is safe for unprotected workers to reenter.

7.2 LOWER EXPLOSIVE LIMIT/OXYGEN (LEL/O₂) METER

Prior to entering a confined space area, LEL/O₂ measurements must be collected. The measurements and permit requirements are discussed further in Appendix B.

7.3 AIR MONITORING LOG

The site chemist will ensure that all direct reading air-monitoring data is logged into a monitoring notebook. Data will include instrument used, wind direction, work process, etc. The OHM certified industrial hygienist will periodically review this data.

7.4 CALIBRATION REQUIREMENTS

The LEL/O₂ meter and pumps required with fixed-media air sampling will be calibrated daily prior to use. A log will be kept detailing date, time, span gas, or other standard, and name of person performing the calibration.

8.0 JOB SITE TRAINING

Before commencing this project and for all OHM personnel new to the site, a training session will be held by the site superintendent to cover project-related topics. For this particular project, topics would include:

- o Review of acute and chronic effects of materials found on site
- o Work zones - exclusion, contamination reduction, and support
- o Levels of protection - B, C, and D
- o Decontamination procedures
- o Emergency procedures
- o Heat stress
- o Work site rules
- o Electrical safety
- o Permitting procedures
- o Location of site safety plan and Material Safety Data Sheets

8.1 DAILY TRAINING

Each morning before work begins, a short 10- to 20-minute training session will be held by the site superintendent covering one of the previously mentioned topics along with daily instructions.

8.2 PREPHASE TRAINING

Before a new phase of work is begun, a training session will be held covering safety topics related to the particular phase.

8.3 RECORDS

All training sessions, topics, attendance, training officer, and date of training will be recorded in a training log book.

9.0 EMERGENCY PROCEDURES

Written standard operating procedures will be developed for emergency events. These procedures detail appropriate actions for fire, medical, and personnel exposure events. The following subsections detail specific emergency guidelines and information for this project.

9.1 EMERGENCY TELEPHONE NUMBERS

The following emergency telephone numbers will be prominently posted near each telephone:

- o Fire department
- o Ambulance service
- o Police department
- o Hospitals
- o Paramedics

9.2 EMERGENCY SIGNAL

The emergency signal is a continuous 30-second blast on a hand-held air horn. Horns will be located in the crew and office trailers and at the outer perimeter of each contamination reduction zone. In an emergency, all personnel will be assembled in the support zone or other designated area, accounted for, and given directions on how to proceed by the site supervisor or in his absence, by the senior foreman present. If personnel are working in the exclusion zone, they will exit through the most practical exit. If the emergency warrants rapid egress from the exclusion zone, decontamination will be accomplished in the most practical means available. The OHM site supervisor is responsible for establishing egress paths and assembly areas.

9.3 MEDICAL EMERGENCY

In any life-threatening situation, the safety of the individual takes precedence over all procedures designed for protection against chemical contamination at the site. Because there are no known acute life-threatening effects from the concentrations expected to be found at the site (with the exception of work inside confined spaces), all responses to emergency situations will be dealt with in the most expeditious manner possible.

9.3.1 Worker Procedure

The nearest workers should immediately assist any person who shows signs of medical distress or who has suffered an accident. The on-site crew supervisor should be summoned and depending on the nature of the emergency, should request by radio to the office trailer that the emergency medical team (EMT) be called. If a breathing or heart problem is apparent, remove the victim's respirator and loosen the clothing around the victim's neck and chest.

9.4 EMERGENCY EQUIPMENT

In each operative decontamination area, an emergency station will be set up and will consist of an eye-wash station, first-aid kit, and 20-pound ABC fire extinguisher. Additional fire extinguishers, a stretcher, and an emergency shower are located in the decontamination trailer.

9.5 "BUDDY" SYSTEM

All work in the exclusion zone will be done using the "buddy" system. Prior to entering the exclusion zone, buddies will be assigned. Buddies are responsible for ensuring each other's safety and should be aware of the potential of exposure to materials found on site and general hazards of the work place.

10.0 HIGH-PRESSURE WASHER (LASER) SAFETY PROCEDURES

The high-pressure washers (lasers) are some of the most effective pieces of equipment OHM owns, but also some of the most potentially dangerous. The manufacturer and OHM have set safety precautions to be followed by the user to make the laser and sandblaster safe pieces of equipment.

10.1 SAFETY EQUIPMENT

Safety equipment to be worn by the operators will include:

- o Personal protective equipment as specified in Section 4.0
- o Metal foot and shin guards
- o Hearing protection
- o Faceshield
- o PVC rain suit (for lasering)

10.2 SAFETY PROCEDURES

The following procedures will be followed to ensure the safety of operators and assistants:

- o The lance must always be pointed at the work area.
- o The operator must maintain good footing.
- o The operator must have an assistant to aid in moving the hose to different areas.
- o Nonoperators must remain a safe distance from the operator. This distance must be a minimum of 25 feet.
- o The operating pressure should never exceed that which is necessary to complete the job.
- o No unauthorized attachment may be made to the unit. (The trigger should never be tied down.)
- o Operators should be changed at frequent intervals to avoid fatigue.
- o All operators must be properly trained in the use of the power washer.
- o Equipment should be cleaned often to avoid dirt buildup, especially around the trigger and guard area.

11.0 GENERAL SAFETY

In addition to the specific guidelines and procedures detailed in the preceding sections, some general safety precautions will apply to this project.

11.1 SITE SAFETY OFFICER (SSO)

Jack Bender is OHM's SSO for the company at this site. Mr. Bender's responsibilities will include:

- o Ensuring compliance with the site safety plan
- o Conducting daily safety meeting
- o Overseeing the project chemists' issuing of permits for confined space entry and hot work
- o Providing chemical information to workers
- o Investigating and documenting accidents
- o Coordinating air monitoring with site chemist
- o Conferring with OHM's designated corporate safety manager, David Mummert, on a regular basis

11.2 EATING, DRINKING, AND SMOKING

Eating, drinking, and smoking will only be permitted in designated area. No tobacco products or matches and lighters are to be carried into the exclusion zones.

11.3 SAFETY GLASSES AND HARDHATS

Hardhats and safety shoes or boots will be worn on site.

11.4 FLAMMABLE LIQUID STORAGE

Flammable liquid storage areas shall be established and a tape barrier erected with both "Flammable Liquid" and "No Smoking" signs prominently posted.

11.5 WASTEWATER CONTAINMENT

An area in which potentially contaminated wastewater will be treated will be established and a tape barrier erected with "Danger" signs prominently posted.

11.6 PARKING

Parking will be permitted only in designated areas.

11.7 HAZARDOUS WASTE DRUM STORAGE

An area will be designated and prominently posted for hazardous waste drums. Full drums shall be promptly sent to an authorized disposal facility.

11.8 COOLERS

All coolers will be prominently marked either "Food Only" or "Samples Only."

11.9 FIRE LANES

During the work process, extreme care will be used in planning operations so that no fire lanes are blocked.

11.10 CORPORATE SAFETY AND HEALTH INSPECTIONS

A site safety and health inspection will be conducted at least monthly by the corporate safety and health staff.

11.11 SAFETY REEVALUATION

As conditions change, the site supervisor may institute more or less stringent procedures than those outlined in this plan. Any reduction of safety will be implemented only after consultation with appropriate health and safety personnel at corporate headquarters.

APPENDIX A

MATERIAL SAFETY DATA SHEETS

MATERIAL SAFETY DATA SHEET

GENIUM PUBLISHING CORPORATION
1145 CATALYN STREET
SCHENECTADY, NY 12303-1836 USA
(518) 377-8855



No. 1200

AROCLOR 1254

Date May 1980

SECTION I. MATERIAL IDENTIFICATION

MATERIAL NAME: AROCLOR 1254

DESCRIPTION: Distillation cut of polychlorinated biphenyl (or diphenyl), containing 54% Cl.
OTHER DESIGNATIONS: PCB, an Askarel, PYRANOL, GE Material A13B1, CAS # 027 323 188
MANUFACTURER: Material was a product of Monsanto Co., but dropped in 1977. Except for uses specifically exempted and regulated by EPA (for example power transformers), legal manufacture, distribution in commerce, and use of PCB's in USA ended in 1979 under TSCA.

SECTION II. INGREDIENTS AND HAZARDS

Mixture of Chlorinated Biphenyls, $C_{12}H_{10-x}Cl_x$:

x	Approx. %
2	0.5
3	1
4	21
5	48
6	23
7	6

Includes 69 or more compounds with average of 4.98 Cl atom/molecule. Mixture may contain 0-2 ppm chlorinated dibenzofurans.

*Current ACGIH 8-hr TWA is 0.5 mg/m³. NIOSH has proposed a 10-hr TWA of 1.0 µg/m³. Materials with over 50 ppm PCB content are regulated for handling, storage, records, and waste disposal. EPA criterion in navigable waters is 0.001 µg/L PCB's.

ca 100

HAZARD DATA

EPA exemption or authorization needed for any measurable exposure*
Rat, Oral LD₅₀ 4-10 g/kg
Weaning 1.2 g/kg
Rat, Intravenous LD₅₀ 358 mg/kg
Rat, Oral, TDLo 1220 mg/kg/35 wk (neoplastic effect)

SECTION III. PHYSICAL DATA

Boiling range at 1 atm, deg C	---- ca 360-390	Specific gravity (65/15.5 C)	-- 1.5
Vapor pressure at 150 C, mm Hg	--- <1	Pour point, deg C	----- 10
Water solubility at 25 C, ppm	---- ca 0.01	Molecular weight (Av)	----- 327
Viscosity at 100 F, cstk	----- ca 460	Partition Coef. (octanol/water)	>10 ⁴

Appearance & Odor: A light yellow, viscous fluid.

SECTION IV. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temp.	Flammability Limits In Air	LOWER	UPPER
None to boiling point				

Extinguishing Media: Use media appropriate to the surrounding fire conditions. This material has very low combustibility, but it can undergo thermal-oxidative degradation in a fire situation.

Firefighters should use full protective clothing and self-contained breathing equipment when fighting fire where any PCB's are involved.

SECTION V. REACTIVITY DATA

AROCLOR 1254 and other PCB's are nearly inert materials with very high chemical stability; the higher chlorine levels usually give the greater stability. At about 300 to 600 C some PCB's can oxidize to produce chlorinated dibenzofurans which are much greater in toxicity than the PCB's. For complete incineration of PCB's a 2-second dwell time above 2000 F (1090 C) with 3% excess oxygen in the stack is suitable (see Sect. VII).

AROCLOR 1254 shows very little degradation after 3 weeks exposure to direct sunlight.

PCB's are strongly absorbed on particulates or sediments in aquatic systems (streams, lakes, ocean, etc.).

Mixed in activated sludge, biodegradation occurs slowly, but only very slowly or almost not at all with compounds above Cl₄.

SECTION VI. HEALTH HAZARD INFORMATION

TLV (See Sect. II)

PCBs show high levels of bioaccumulation in fatty tissue and very slow metabolism, especially for Cl₅ compounds and above. They have become widely dispersed in world-wide environment and in the food chain (much like DDT) since their introduction in 1929.

Effective control of PCB discharge into the environment began after 1970.

AROCOR 1254 has a low vapor pressure, but it can be irritating to the eyes, nose, and throat if misted or heated to produce vapors. Excessive acute and chronic exposures may cause liver damage. Chronic exposure to or ingestion of PCB's (especially when thermally oxidized) can result in chloracne after 1-6 months. There is some evidence of possible carcinogenic risk and adverse reproductive effects with this material. PCB's may appear in the breast milk of an exposed mother.

FIRST AID:

Skin Contact: Clean exposed skin with waterless cleaner, wipe with a disposable towel, then wash with soap and water. Promptly remove contaminated clothing. (Control separate disposal of PCB-contaminated materials.)

Eye Contact: Flush promptly & thoroughly with lots of running water for 15 minutes.

Inhalation: Remove to fresh air. Get medical help if symptoms continue.

Ingestion: Get medical help. NIOSH has recommended that vomiting be induced.

Get medical help in all cases of severe exposure, repeated exposures, or persistent symptoms.

SECTION VII. SPILL, LEAK, AND DISPOSAL PROCEDURES

Notify safety personnel of all PCB spills or leaks. Promptly contain spilled material! Prevent its release into the environment! Restrict PCB spill area to trained clean-up personnel; use proper protective gear; follow an established emergency plan.

Stop leakage if possible. Pick up spill. Absorb small spills and residues using a powdered, dry clay. Place leaking containers, picked-up PCBs, and PCB-contaminated materials and refuse into approved, properly labeled, closed containers for storage under controlled, EPA regulated conditions prior to disposal. EPA allows approved storage to 1/1/84. (See Sect. IX.) Storage: 40CFR761.42; Annual report: 40CFR761.45

DISPOSAL: Destroy PCB-containing material by burning in an EPA approved facility. Liquid 50-500 ppm PCB material can be burned as above or landfilled if not ignitable. Non-flowing, PCB-contaminated debris can be disposed of in an EPA approved landfill. (See 40CFR 761; Federal Register, Vol. 44, 31551-4, 66989; Vol. 45, 20473.)

SECTION VIII. SPECIAL PROTECTION INFORMATION

Provide highly effective local exhaust ventilation (trap for exhaust vapors) especially if this material is heated or misted. Unless authorized by EPA an isolated system must be used for PCBs.

For nonroutine and emergency conditions of exposure use an approved canister respirator or self-contained breathing equipment.

Prevent skin contact for those who work with PCBs. Use neoprene or polyethylene gloves and apron, safety glasses and/or face shield, and other protective clothing as determined by use conditions. An eyewash station and washing facilities should be available to the work area.

Provide for special handling and disposal of PCB-contaminated materials, including paper towels and clothing (see Sect. VII). Provide locker and shower facilities. Workers must be trained for PCB work, and they must follow good hygienic practice.

Provide pre-placement medical exams for workers with emphasis on liver function, skin condition, and reproductive history. Provide annual medical exams for exposed workers.

SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS

PCB materials in containers and in equipment must have proper labeling including the date of storage. Short term (up to 30 days) storage of non-leaking PCBs can be done. Long term storage requires an EPA approved facility, including such criteria as roof and walls to shield from rain, impervious base and diking which will contain 25% of stored volume or twice the volume of the largest container, no drains or openings to allow flow loss, and the base must be located above the 100-year flood water elevation.

Prevent physical damage to containers. Inspect storage frequently.

Prevent skin contact with PCBs, or with solid products contaminated with PCBs. Prevent inhalation of airborne PCBs. Properly contain PCBs until legally disposed of; do not allow them to escape into the environment!

PCBs, and especially used PCBs, can contain higher toxicity contaminants.

DATA SOURCE(S) CODE: 1-6, 20, 26, 31, 36

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APPROVALS: MIS
CRD

Industrial Hygiene
and Safety

MEDICAL REVIEW: June 1980

MATERIAL SAFETY DATA SHEET

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No. 15A

CHRYSTOTILE ASBESTOS

Date November 1979

SECTION I. MATERIAL IDENTIFICATION

MATERIAL NAME: CHRYSTOTILE ASBESTOS

DESCRIPTION: A crystalline serpentine mineral, or layered, hydrated magnesium silicate in fine fiber form (asbestiform). The end of a sliver of this material with a cross-section of 0.1 mm² can show about 20 million tubules (scroll-like fibrils about 0.01 µm diameter) in approximate parallel orientation. It is possible to strip from a fiber bundle very fine chrysotile threads, each an agglomerate of hundreds or thousands of hollow fibrils. (90% of asbestos used is chrysotile.)

OTHER DESIGNATIONS: Asbestos, CAS #001 332 214, GE Material D4E11

SECTION II. INGREDIENTS AND HAZARDS

Idealized Chrysotile (unit cell) - Mg₃Si₂O₅(OH)₄*

*Impurities include low levels of Mn, Fe⁺², Fe⁺³, and Al in the structure, replacing randomly 4% av. of the Mg atoms. Impurities depend on the mineral source; the unit cell hydroxyl content can also vary with an average of 4.25.

**Current OSHA TLV. OSHA (1975) proposed TLV of 0.5 fb/cc with a Ceiling of 5 fb/cc (15 min. sample). NIOSH (1976) proposed 0.1 fb/cc. ACGIH (1979 Intended Changes List) has retained TLV of 2 fb/cc for chrysotile asbestos. Asbestos is carcinogenic and/or co-carcinogenic for humans!

ca 95

HAZARD DATA

8-hr TWA 2 fibers/cc,*
Ceiling 10 fibers/cc,
(>5 µm in length)
"Asbestos"
Human, inhal.
TDL 1.2 fb/cc for
19 years
(Pulmonary effects)

SECTION III. PHYSICAL DATA

Melting point ----- Decomposes (see Sect. V)

Vapor pressure ----- Nil

Water solubility ----- Insoluble (slowly breaks down in hot water)

Appearance: White, fibrous solid, as long flexible textile fibers down to dust-like filler power. [Milled chrysotile asbestos (powder-like) has an aspect ratio (ratio of length/diameter) as high as 50 for most particles.]

SECTION IV. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temp.	Flammability Limits In Air
N/A	N/A	N/A

LOWER UPPER

This material is not combustible in air. Use extinguishing media as appropriate for the surrounding materials in a fire situation.

SECTION V. REACTIVITY DATA

This material is inert under ordinary room temperature and heated use conditions. It is resistant to heat, but it will decompose and alter its microscopic fiber structure (see Sect. I) above 600 C (1112 F): Chrysotile dehydroxylates at 600-780 C; the "asbestos anhydride" in turn breaks down to mixture of silica (SiO₂) and forsterite (Mg₂SiO₄) at 800-850 C. Above 1000 C (1832 F) magnesium pyroxenes are formed which melt at about 1450 C.

Strong acids can attack chrysotile and rapidly extract its MgO and H₂O content; it can be decomposed by glacial acetic acid. Hot water slowly breaks down chrysotile. It, like other forms of asbestos, resists strong alkali (5 M NaOH at least up to 100 C).

SECTION VI. HEALTH HAZARD INFORMATION	TLV 2 fibers/cc (See Sect. II) >5 μ m in length			
<p>As a particulate material, chrysotile asbestos can be irritating to the respiratory tract, skin or eyes. However, the significant industrial hazards arise from excessive dust inhalation with damage requiring years to become evident. Chronic inhalation of high levels of asbestos particles can produce asbestosis, a disabling fibrosis of the lungs which gradually reduces lung capacity and efficiency. (Usually over 4 years is required for a serious condition to develop.) Excessive inhalation can also cause pleural plaque, a thickening of the lung lining. Compliance with TLV is expected to control these hazards.</p> <p>Cancer can result from excessive inhalation of asbestos particulate, which may require decades to develop. Lung cancer is a special risk to those who smoke cigarettes regularly in addition to having asbestos exposure. Rare mesotheliomas of the pleura and peritoneum (lining around the lungs or abdominal cavity) and possibly cancers of the GI tract and larynx (also smoking related) have been associated with inhalation exposure to asbestos particles. (Crocidolite asbestos has been suggested as the major mesothelioma risk.)</p> <p>In groups of workers exposed to asbestos, lung cancer death is 3 or 4 times more common than mesothelioma death, and 97.5% of asbestos-related lung cancers occur with those workers who also smoke cigarettes! For non-smokers asbestos exposure increases risk of lung cancer 5X.</p>				
SECTION VII. SPILL, LEAK, AND DISPOSAL PROCEDURES				
<p>Notify safety personnel of spills! Exclude all from spill area except trained clean-up personnel who have approved respiratory protection against dust. Provide exhaust ventilation with capture filtration, but do not stir up the dust. Use a wet method or an approved vacuum cleaning system to pick up spills. The techniques used must collect particulate without dispersing dust into the air. Waste must be placed in dust-tight containers or sealed plastic bags for disposal. Label properly!</p> <p>DISPOSAL: Deposit waste containers in a secured landfill where asbestos will remain buried. Follow Federal, State and local regulations. Also note that chrysotile can be converted into non-asbestos waste by heating at high temperature (see Sect. V).</p>				
SECTION VIII. SPECIAL PROTECTION INFORMATION				
<p>Provide exhaust ventilation and capture filtration to remove airborne asbestos particulate from the workplace (as much as possible) without dispersing it into the environment. Isolate work areas (also post signs) where asbestos particulate may occur at excessive levels.</p> <p>For nonroutine or emergency conditions where excessive dust is present, approved respirators must be used: Single use or re-usable air-purifying respiratory up to 10X TLV; full-facepiece powered air-purifying respirator up to 100X TLV; full-facepiece air-supplied (continuous flow or pressure-demand type) respirator above 100X TLV.</p> <p>Depending on exposure levels, it may be necessary to provide body-covering work clothes, special vacuuming facilities for clothes and suitable laundering or disposal arrangements, change areas with dual locking facilities, showers before changing to street clothing after work, etc. Be sure workers do not carry asbestos dust home on their clothing or person. Prevent asbestos dust from being carried to rest rooms, to eating areas, to non-asbestos workplaces, etc.</p>				
SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS				
<p>Store asbestos in closed containers (dust tight) in a clean, secure area. Protect containers from physical damage. Do not open containers that can release asbestos dust without providing proper enclosure or control measures. Use dust suppression control measures at all stages of asbestos handling, use and disposal. Follow good housekeeping practices to prevent accumulations of asbestos-containing dust. Avoid inhalation of asbestos. The effects on cancer incidence of chronic exposure are not yet fully known. Monitor areas where asbestos dust is present to be sure of worker exposure levels; keep records to define exposures and retain for at least 20 years. Provide preplacement and annual medical examinations for those exposed in the workplace to 8-hr TWA of 0.1 asbestos fibers or more/cc which are >5 μm in length. Retain medical records for at least 20 years.</p>				
DATA SOURCE(S) CODE: 2-4, 6, 12, 14, 20, 26, 32	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;"> APPROVALS: MIS, CRD <i>J. M. Nielsen</i> </td> </tr> <tr> <td style="padding: 5px;"> Industrial Hygiene and Safety </td> </tr> <tr> <td style="padding: 5px;"> MEDICAL REVIEW: 12/79 </td> </tr> </table>	APPROVALS: MIS, CRD <i>J. M. Nielsen</i>	Industrial Hygiene and Safety	MEDICAL REVIEW: 12/79
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APPENDIX B

STANDARD SAFETY PROCEDURE
CONFINED SPACE ENTRY PROCEDURE

STANDARD SAFETY PROCEDURE CONFINED SPACE ENTRY PROCEDURE

1.0 PURPOSE

The purpose of this procedure is to prevent serious accidents which could result from entry into confined spaces. Use of a combustible gas indicator and toxic gas indicator is required.

2.0 SCOPE

This procedure will apply to all employees of O.H. Materials Corp. (OHM).

3.0 CONFINED SPACE POLICY

No employees of OHM are to enter a confined space unless a confined space permit has been completed. It is the responsibility of the project supervisor to request this permit. The confined space permit shall be signed by and explained to each employee working the confined space project; their signatures will indicate the understanding of the rules outlined in the permit.

The confined space permit will be valid for a single work shift only. On projects requiring more than a single work shift, a new permit shall be completed at the start of each shift. The permit shall be displayed at the project site.

At the conclusion of the project, the confined space work permits shall be forwarded to the Safety Department at OHM's corporate office in Findlay, Ohio. The permits shall be kept on file for 1 year.

It is the responsibility of the project supervisor to see that workers comply with all safety conditions and practices of the confined space permit.

4.0 CONFINED SPACE ENTRY PROCEDURE

Each confined space shall be tested for combustible vapors, oxygen level, and toxicity. When levels of combustible vapors exceed 10 percent of the lower explosive limit (LEL), all sources of ignition shall be removed. Entry shall

not be made until the space is flushed or purged below the 10 percent LEL level. Each confined space must be tested for oxygen content prior to entry. The minimal acceptable percent of oxygen is 19.5 percent. If this level cannot be met, a supplied-air respirator must be used. Each confined space must be tested for toxic vapors. Chemical protective equipment must be worn if a skin contact problem exists. These tests should be conducted by field technical personnel, using draeger, monitox, or other monitors.

Welding and/or cutting in a confined space shall require the use of a hot work permit. Cutting gas cylinders and welding machines will not be taken into confined spaces.

The project supervisor is responsible for evaluating general safety hazards including permits, locking out of equipment, adequate lighting, tools, etc.

Before work is started in a confined space, all product lines and electrical lines shall be locked and tagged.

A ladder is required in all confined spaces deeper than the employees' shoulders. The ladder shall be secured and not removed until all employees have exited the space.

All employees entering a confined space shall wear an approved safety harness; when the confined space is entered through a manhole or is deeper than the employees' shoulders, an approved lifeline should be attached. When the nature of the space entered involves more than one employee and the fouling of lifelines could occur, the Safety Department should be consulted.

Rescue equipment must be at the project site prior to commencing work. Rescue equipment will include extra rope, safety harnesses, stretchers, and emergency SCBA. No one should enter a confined space until adequate safety equipment is present to remove an unconscious person.

5.0 CONFINED SPACE ENTRY PROCEDURES FOR SAFETY OBSERVER

Employees entering a confined space must be under the constant observation of a safety observer. It is the safety observer's responsibility to follow this procedure.

- o A valid confined space entry permit must be at the site.
- o Rescue equipment must be available at the site.

- o The safety observer must know the location of the nearest telephone and emergency numbers, safety shower, and fire extinguishers.
- o When welding or cutting is done in a confined space, the safety observer must know how to shut down the equipment.
- o The safety observer must remain in constant contact with the employees in the confined space. The observer is not to leave his/her assigned station space except to report an emergency.

CONFINED SPACE ENTRY PERMIT

Job Description _____

Project Location _____

Date _____

Employee working in confined area _____

Are lines, valves, locked or capped _____

Are electrical lines locked out _____

Are life lines, safety belts provided _____

Fire extinguishers _____

Test Conducted

O₂ _____ 19.5% or less O₂ _____

Supplied air required _____

LEL _____ 10% LEL no work _____

Toxicity _____

Safety equipment used _____

Additional Comments _____

Supervisor _____ Foreman _____

(THIS PERMIT VALID FOR ONE WORK SHIFT ONLY)